What is claimed is:

1. A method of aligning an optical array with a substrate, such method comprising the steps of:

aligning the substrate with a set of alignment structures on an alignment fixture;

transmitting a plurality of optical signals from the fixture through the substrate; and

automatically aligning the optical array to the substrate using the transmitted plurality of optical signals and a pick and place machine.

2. The method of aligning an optical array with a substrate as in claim 1 further comprising defining the set of alignment structures as a plurality of passive alignment guide pins protruding from a top surface of the alignment fixture.

3. The method of aligning an optical array with a substrate as in claim 2 wherein the step of aligning the substrate with a set of alignment structures on an alignment fixture further comprises inserting the a plurality of guide pins of the alignment fixture through a respective plurality of apertures in the substrate.

4. The method of aligning an optical array with a substrate as in claim 3 wherein the step of transmitting a plurality of optical signals through the substrate further comprises transmitting the plurality of optical signals directly through an optically transparent substrate.

5. The method of aligning an optical array with a substrate as in claim 3 further comprising identifying the plurality of optical signals transmitted from the fixture with a first optical detector, for locating the position of the optical signals in a reference plane created by the substrate.

6. The method of aligning an optical array with a substrate as in claim 5 further comprising identifying a plurality of reference marks on the optical array with a second optical detector, for locating and properly aligning the array to the substrate.

7. The method of aligning an optical array with a substrate as in claim 6 further comprising defining the second plurality of registration marks on the substrate as a substantially thin layer of metal.

8. The method of aligning an optical array with a substrate as in claim 7 wherein the step of automatically aligning the optical array to the substrate further comprises aligning the plurality of reference marks on the optical array to specific distance from the plurality of transmitted optical signals in the reference plane created by the substrate.

9. The method of aligning an optical array with a substrate as in claim 8 further comprising attaching the optical array to the substrate with an adhesive.

10. The method of aligning an optical array with a substrate as in claim 9 further comprising disposing a set of conductive traces on the substrate for electrically connecting the optical array.

11. An apparatus for aligning an optical array with a substrate, such apparatus comprising:

a substrate aligned with a set of alignment structures on an alignment fixture;

a plurality of optical signals transmitted from the alignment fixture through the substrate; and

a pick and place machine adapted to align the optical array to the substrate using the transmitted plurality of optical signals.

12. The apparatus for aligning an optical array with a substrate as in claim 11 wherein the alignment structures on the alignment fixture are further defined as alignment guide pins protruding from a top surface of the fixture.

13. The apparatus for aligning an optical array with a substrate as in claim 12 further comprising a set of alignment apertures disposed in the substrate such that the alignment guide pins of the fixture insert through the set of apertures in the substrate.

14. The apparatus for aligning an optical array with a substrate as in claim 13 wherein the substrate further comprises an optically transparent substrate such that the plurality of optical signals pass directly through the substrate.

15. The apparatus for aligning an optical array with a substrate as in claim 13 further comprising a means for identifying a plurality of registration marks on the optical array in a plane created by the substrate.

16. The apparatus for aligning an optical array with a substrate as in claim 15 wherein the plurality of registration marks disposed on the optical array are further defined as a substantially thin layer of metal.

17. The apparatus for aligning an optical array with a substrate as in claim 16 further comprising a means for identifying the plurality of optical signals transmitted through the substrate for locating the position of the optical signals in the plane created by the substrate.

18. The apparatus for aligning an optical array with a substrate as in claim 17 further comprising an adhesive for attaching the optical array to the substrate.

19. The apparatus for aligning an optical array with a substrate as in claim 18 further comprising a set of conductive traces disposed on the substrate for electrically connecting the optical array.

20. A method of aligning an optical array with a substrate, such method comprising the steps of:

providing a substrate aligned to an alignment fixture;

identifying a first plurality of registration marks in the alignment fixture with a first recognition module;

identifying a second plurality of registration marks on the optical array with a second recognition module; and

attaching the optical array to the substrate, such that the first plurality of registration marks of the optical array are located at a known distance from the second plurality of registration marks in the alignment fixture, with respect to a plane created by a first surface of the alignment fixture.

21. The method of aligning an optical array with a substrate as in claim 20 wherein the step of aligning the substrate to the fixture further comprises providing a plurality of passive alignment guide pins in the alignment fixture and inserting the plurality of passive alignment guide pins through a respective plurality alignment apertures in the substrate.

22. The method of aligning an optical array with a substrate as in claim 21 further comprising defining the first plurality of registration marks in the alignment fixture as a plurality of optical signals transmitted from the alignment fixture through the substrate.

23. The method of aligning an optical array with a substrate as in claim 22 further comprising transmitting the plurality of optical signals directly through an optically transparent substrate.

24. The method of aligning an optical array with a substrate as in claim 22 further comprising defining the second plurality of registration marks on the substrate as a substantially thin layer of metal.

25. The method of aligning an optical array with a substrate as in claim 24 further comprising disposing a set of conductive traces on the substrate for electrically connecting the optical array.

26. An apparatus for aligning an optical array with a substrate, such apparatus comprising:
a substrate aligned to an alignment fixture;
means for identifying a first plurality of registration marks in the alignment fixture;
means for identifying a second plurality of registration marks on the optical array; and
means for attaching the optical array to the substrate such that the first plurality of registration marks of the optical array are located at a known distance from the second plurality

of registration marks in the alignment fixture, with respect to a plane created by a first surface of the alignment fixture.

27. The apparatus for aligning an optical array with a substrate as in claim 26 further comprising a plurality of passive alignment guide pins in the alignment fixture inserted through a respective plurality of alignment apertures in the substrate.

28. The apparatus for aligning an optical array with a substrate as in claim 27 wherein the registration marks in the alignment fixture are further defined as a plurality of optical signals transmitted from the alignment fixture through the substrate.

29. The apparatus for aligning an optical array with a substrate as in claim 28 wherein the substrate further comprises an optically transparent substrate such that the plurality of optical signals pass directly through the substrate.

30. The apparatus for aligning an optical array with a substrate as in claim 28 wherein the plurality of registration marks disposed on the optical array are further defined as a substantially thin layer of metal.

31. The apparatus for aligning an optical array with a substrate as in claim 30 further comprising an adhesive for attaching the optical array to the substrate.

32. The apparatus for aligning an optical array with a substrate as in claim 31 further comprising a set of conductive traces disposed on the substrate for electrically connecting the optical array.